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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hideo Nagai

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52044

7590

02/05/2009

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EXAMINER

MONTALVO, EVA Y

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,780	Applicant(s) NAGAI ET AL.	
	Examiner Eva Montalvo	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/13/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-18 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/28/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action responds to the election filed on 11/13/2008.

Election/Restrictions

2. Applicant's election without traverse of Group I, reading on claims 1-18 filed on 11/13/2008 is acknowledged and entered into the record.
3. Claims 19-28 are canceled.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 6-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hahn (US 2003/0168664 and Hahn hereinafter).

Hahn discloses a semiconductor light emitting device (see Fig. 2 and [0028]) comprising a multilayer epitaxial structure (3) including a first conductive layer (5), a second conductive layer (4), and a light emitting layer (19) between the first conductive layer and the second conductive layer, a main surface of the second conductive layer which faces away from the light emitting layer being a light extraction surface; a first electrode (6) formed on a main surface of the first conductive layer which faces away from the light emitting layer; and a second electrode (7) formed on the main surface of the second conductive layer which faces away from the light emitting layer; a first power supply terminal (22) that is electrically connected to the first electrode and forms at least part of a metal layer, the multilayer epitaxial structure being formed

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on the metal layer in such a manner that the first conductive layer is closer to the metal layer than the second conductive layer is, the metal layer supporting the multilayer epitaxial structure, and conducting heat generated in the light emitting layer; and a second power supply terminal (23) that is electrically connected to the second electrode by means of a conductive member (17) which extends from the second electrode in a direction parallel to the main surface of the second conductive layer.

As to claims 2, 6-8, and 10 Hahn disclose a device (see Fig. 2 and [0028]), where the metal layer is electrically divided into at least two portions, and at least one of the portions is constituted as the first power supply terminal, and at least one of a rest of the portions is connected to the second electrode, to be constituted as the second power supply terminal; the first electrode is formed on substantially the entire main surface of the first conductive layer which faces away from the light emitting layer, and reflects light emitted from the light emitting layer; the second electrode is a transparent electrode which transmits the light emitted from the light emitting layer; and the second electrode is formed on substantially the entire main surface of the second conductive layer which faces away from the light emitting layer; and each of the first conductive layer, the light emitting layer, and the second conductive layer is made of a compound semiconductor including nitrogen.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn in view of Mueller-Mach et al. (US 6,501,102 and Mueller hereinafter).

Although the device disclosed by Hahn shows substantial features of the claimed invention, it fails to expressly teach a device, where a phosphor layer formed on the multilayer epitaxial structure so as to cover the main surface of the second conductive layer which faces away from the light emitting layer, the phosphor layer including a light emitting substance which is excited by the light emitted from the light emitting layer, to emit light.

Nonetheless, these features are well known in the art and would have been an obvious modification of the device disclosed by Hahn, as evidenced by Mueller.

Mueller discloses a device, where a phosphor layer (22) formed on the multilayer epitaxial structure (2) so as to cover the main surface of the second conductive layer (4) which faces away from the light emitting layer (5), the phosphor layer including a light emitting

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substance which is excited by the light emitted from the light emitting layer, to emit light (see Figs. 1 and 2, and col. 5, lines 5-40).

Since Hahn and Mueller are in the same field of endeavor, a person having ordinary skill in the art at the time of invention would have readily recognized the desirability and advantages of modifying Hahn, as suggested by Mueller, by employing a phosphor layer over the multilayer epitaxial structure. This phosphor layer would absorb selected wavelengths of light emitted by the multilayer epitaxial structure and emit light in the desired wavelengths to produce a brighter or purer color of light (see col. 5, lines 16-40).

9. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn in view of Chen (US 6,562,643 and Chen hereinafter).

Although the device disclosed by Hahn shows substantial features of the claimed invention, it fails to expressly teach a lighting module comprising a printed wiring board including a bonding pad; and a semiconductor light emitting device as defined in claim 1, the semiconductor light emitting device being mounted on the printed wiring board by connecting a metal layer included in the semiconductor light emitting device to the bonding pad; and a light apparatus comprising a light module as define in claim 17.

Nonetheless, these features are well known in the art and would have been an obvious modification of the device disclosed by Ignatius in view of Hahn, as evidenced by Chen.

Chen discloses a module comprising a printed wiring board (1) including a bonding pad; and a semiconductor light emitting device (7) as defined in claim 1, the semiconductor light emitting device being mounted on the printed wiring board by connecting a metal layer (2) included in the semiconductor light emitting device to the bonding pad (see Fig. 6); and a light

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apparatus (i.e., traffic signal lights) comprising a light module as define in claim 17 (see col. 2, lines 2-7).

Since Hahn and Chen are in the same field of endeavor, a person having ordinary skill in the art at the time of invention would have readily recognized the desirability and advantages of modifying Hahn, as suggested by Mueller, by employing a phosphor layer over the multilayer epitaxial structure. This phosphor layer would absorb selected wavelengths of light emitted by the multilayer epitaxial structure and emit light in the desired wavelengths to produce a brighter or purer color of light (see col. 5, lines 16-40).

10. Claims 11-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ignatius et al. (US 5,278,432 and Ignatius hereinafter) in view of Hahn.

Ignatius discloses a semiconductor light emitting device (see Figs. 1-4) comprising a light emitting element array (10) formed in such manner that a plurality of light emitting elements are connected in series.

Ignatius fails to disclose that each of the plurality of light emitting elements include a multilayer epitaxial structure including a first conductive layer, a second conductive layer, and a light emitting layer between the first conductive layer and the second conductive layer, a main surface of the second conductive layer which faces away from the light emitting layer being a light extraction surface; a first electrode formed on a main surface of the first conductive layer which faces away from the light emitting layer; and a second electrode formed on the main surface of the second conductive layer which faces away from the light emitting layer.

Nonetheless, these features are well known in the art and would have been an obvious modification of the device disclosed by Ignatius, as evidenced by Hahn.

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Hahn discloses a semiconductor light emitting device (see Fig. 1 and [0028]) comprising a multilayer epitaxial structure (3) including a first conductive layer (5), a second conductive layer (4), and a light emitting layer (19) between the first conductive layer and the second conductive layer, a main surface of the second conductive layer which faces away from the light emitting layer being a light extraction surface; a first electrode (6) formed on a main surface of the first conductive layer which faces away from the light emitting layer; and a second electrode (7) formed on the main surface of the second conductive layer which faces away from the light emitting layer.

Since Ignatius and Hahn are in the same field of endeavor, a person having ordinary skill in the art at the time of invention would have readily recognized the desirability and advantages of modifying Ignatius as suggested by Hahn, by employing a LED with a p-type layer on an electrically conductive layer. This would impress a current over the entire lateral cross section of the p-type layer, thus improve the device performance (see [0004]).

Ignatius further disclose that the first electrode (14d) and second electrode (14c) are positioned to each other in the same manner for each light emitting element (see Fig. 2); and a metal layer (18) on which the light emitting element array is formed, with an insulating layer therebybetween, in such a manner that the first electrode is positioned closer to the metal layer than the second electrode is, the metal layer connecting and support the multilayer epitaxial structures and conducting heat generated in the light emitting layer, wherein the metal layer is electrically divided into at least two portions; at least one of the portion (18a) is connected to the first electrode of a light emitting element at one end of the light emitting element array, to be constituted as a first power supply terminal, and at least one of a rest of the portions is connected

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to a second electrode of a light emitting element at the other end of the light emitting array, by means of a conductive member (24) which extends from the second electrode in a direction parallel to a main surface of a second conductive layer of the light emitting element, to be constituted as a second power supply terminal.

As to claims 12-14, and 16, Hahn discloses a device (see Fig. 2 and [0028]), where the metal layer is electrically divided into at least two portions, and at least one of the portions is constituted as the first power supply terminal, and at least one of a rest of the portions is connected to the second electrode, to be constituted as the second power supply terminal; the first electrode is formed on substantially the entire main surface of the first conductive layer which faces away from the light emitting layer, and reflects light emitted from the light emitting layer; the second electrode is a transparent electrode which transmits the light emitted from the light emitting layer; and the second electrode is formed on substantially the entire main surface of the second conductive layer which faces away from the light emitting layer; and each of the first conductive layer, the light emitting layer, and the second conductive layer is made of a compound semiconductor including nitrogen.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ignatius in view of Hahn as applied in claim 11, and further in view of Mueller.

Although the device disclosed by Ignatius in view of Hahn shows substantial features of the claimed invention, it fails to expressly teach a device, where a phosphor layer formed on the multilayer epitaxial structure so as to cover the main surface of the second conductive layer which faces away from the light emitting layer, the phosphor layer including a light emitting substance which is excited by the light emitted from the light emitting layer, to emit light.

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Nonetheless, these features are well known in the art and would have been an obvious modification of the device disclosed by Ignatius in view of Hahn, as evidenced by Mueller.

Mueller discloses a device, where a phosphor layer (22) formed on the multilayer epitaxial structure (2) so as to cover the main surface of the second conductive layer (4) which faces away from the light emitting layer (5), the phosphor layer including a light emitting substance which is excited by the light emitted from the light emitting layer, to emit light (see Figs. 1 and 2, and col. 5, lines 5-40).

Since Ignatius, Hahn and Mueller are in the same field of endeavor, a person having ordinary skill in the art at the time of invention would have readily recognized the desirability and advantages of modifying Hahn, as suggested by Mueller, by employing a phosphor layer over the multilayer epitaxial structure. This phosphor layer would absorb selected wavelengths of light emitted by the multilayer epitaxial structure and emit light in the desired wavelengths to produce a brighter or purer color of light (see col. 5, lines 16-40).

Allowable Subject Matter

Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Montalvo whose telephone number is (571)270-3829. The examiner can normally be reached on Monday through Thursday 7:30-5:30 EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marcos D. Pizarro-Crespo can be reached on (571)272-1716. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eva Montalvo
Patent Examiner
Art Unit 2814

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